

1 **Claims**

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3 1) An integrated respirator that provides an airtight
4 barrier for a user's head comprising a first rigid
5 helmet and a flexible cowl having an airtight neck
6 seal, wherein the first rigid helmet defines an
7 access aperture suitable for locating directly on a
8 user's head and the flexible cowl is sealably fixed
9 to the first rigid helmet so providing a physical
10 barrier for the access aperture while forming an
11 airtight seal with a user's neck.

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13 2) An integrated respirator as claimed in Claim 1
14 wherein the first rigid helmet and the flexible cowl
15 comprise a material that protects against nuclear,
16 chemical and biological hazards.

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18 3) An integrated respirator as claimed in Claim 1 or
19 Claim 2 wherein the flexible cowl completely encloses
20 the first rigid helmet.

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22 4) An integrated respirator as claimed in Claim 1 or
23 Claim 2 wherein the flexible cowl is connected to the
24 periphery of the access aperture.

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26 5) An integrated respirator as claimed in Claim 1 or
27 Claim 2 wherein the flexible cowl connects to an
28 inner surface of the first rigid helmet.

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30 6) An integrated respirator as claimed in any of the
31 preceding claims wherein the first rigid helmet
32 provides a tight fit with the user's head.

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- 1 7) An integrated respirator as claimed in any of the
2 preceding claims wherein the integrated respirator
3 further comprises a hood that is fixed to the first
4 rigid helmet so providing a physical barrier for the
5 flexible cowl thus improving the fire proof, snag
6 proof and windblast proof properties of the
7 integrated respirator.
8
- 9 8) An integrated respirator as claimed in any of the
10 preceding claims wherein the flexible cowl comprises
11 a visor aperture, an oxygen mask location area, a
12 visor mist air supply and a pressure release valve.
13
- 14 9) An integrated respirator as claimed in any of the
15 preceding claims wherein the integrated respirator
16 further comprises a second rigid helmet suitable for
17 locating over the first rigid helmet.
18
- 19 10) An integrated respirator as claimed in any of the
20 preceding claims wherein the integrated respirator
21 further comprises an oxygen mask and a first visor.
22
- 23 11) An integrated respirator as claimed Claim 8 wherein
24 the oxygen mask location area comprises a plurality
25 of apertures suitable for receiving one or more
26 component parts of the oxygen mask when the oxygen
27 mask is located within the oxygen mask location area.
28
- 29 12) An integrated respirator as claimed Claim 8 wherein
30 the oxygen mask location area comprises a single
31 aperture suitable for receiving the oxygen mask.
32
- 33 13) An integrated respirator as claimed Claim 10 to Claim
34 13 wherein the oxygen mask comprises a coating that

1 provides a barrier for nuclear, biological and
2 chemical hazards.

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4 14) An integrated respirator as claimed Claim 10 to Claim
5 13 the oxygen mask provides an air tight seal about
6 the user's nose and mouth.

7

8 15) An integrated respirator as claimed in any of the
9 preceding claims wherein the flexible cowl further
10 comprises a detachable front face connected to the
11 flexible cowl by a first airtight seal.

12

13 16) An integrated respirator as claimed in Claim 15
14 wherein the first airtight seal comprises a beading
15 edge associated with the detachable front face, a
16 channel associated with the flexible cowl and
17 suitable for receiving the beading edge and a zip
18 mechanism suitable for opening and sealing the first
19 airtight seal.

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21 17) An integrated respirator as claimed in any of the
22 preceding claims wherein the flexible cowl comprises
23 attachment point access holes and compression seals.

24

25 18) An integrated respirator as claimed in any of the
26 preceding claims wherein the flexible cowl further
27 comprises a head cowl and a detachable lower section
28 the head cowl and detachable lower section being
29 connected by a second airtight seal.

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31 19) An integrated respirator as claimed in Claim 17
32 wherein the second airtight seal comprises a beading
33 edge associated with the head cowl, a channel
34 associated with the detachable lower section and

1 suitable for receiving the beading edge and a zip
2 mechanism suitable for opening and sealing the second
3 airtight seal.

4
5 20) An integrated respirator as claimed in Claim 17 to
6 Claim 19 wherein the first rigid helmet further
7 comprises an energy absorbing liner, attachment
8 points suitable for threading through the attachment
9 point access holes such that the first rigid helmet
10 can be connected to the second rigid helmet.

11
12 21) An integrated respirator as claimed in any of the
13 preceding claims wherein the first rigid helmet
14 further comprises ear phones and at least one
15 earphone aperture associated with each earphone.

16
17 22) An integrated respirator as claimed in Claim 10 to
18 Claim 21 wherein the first rigid helmet further
19 comprises attachment means suitable for connecting
20 oxygen mask mounting means of the oxygen mask to the
21 first rigid helmet.

22
23 23) An integrated respirator as claimed in Claim 21 or
24 Claim 22 wherein the first rigid helmet comprises a
25 retractable earphone mount wherein the retractable
26 earphone mount comprises a bias means that acts to
27 maintain an associated earphone in a first position
28 and a retracting means suitable for overcoming the
29 bias means such that the associated earphone is moved
30 to a second retracted position suitable for aiding
31 the donning and doffing of the integrated respirator.

32
33 24) An integrated respirator as claimed in Claim 23
34 wherein the retracting means comprises a draw string

1 threaded through an aperture in the first rigid
2 helmet.

3

4 25) An integrated respirator as claimed in Claim 24
5 wherein the first rigid helmet further comprises a
6 securing means to which the draw string can be
7 attached so as to maintain the retractable earphone
8 mount in the second retracted position.

9

10 26) An integrated respirator as claimed in Claim 10 to
11 Claim 22 wherein the first visor locates within the
12 first visor aperture so providing a visor airtight
13 seal with the flexible cowl.

14

15 27) An integrated respirator as claimed in Claim 26
16 wherein the visor airtight seal provides means for
17 adjusting the position of the first visor relative to
18 the first rigid helmet.

19

20 28) An integrated respirator as claimed in Claim 27
21 wherein the means for adjustment allows the visor to
22 move to a displaced position suitable for aiding the
23 donning and doffing of the integrated respirator.

24

25 29) An integrated respirator as claimed in Claim 9 to
26 Claim 28 wherein the second rigid helmet further
27 comprises a second visor.

28

29 30) An integrated respirator as claimed in Claim 29
30 wherein the first and second visors comprise a high
31 optical quality material that provides a barrier for
32 nuclear, biological and chemical hazards.

33

1 31) A method of fabricating an integrated respirator
2 comprising the steps of:

- 3 1) Fabricating a flexible cowl;
- 4 2) Forming an oxygen mask location area and a
5 visor aperture in the flexible cowl;
- 6 3) Locating a visor within the visor aperture so
7 as to form an airtight seal between the visor
8 and the flexible cowl;
- 9 4) Locating an oxygen mask within the oxygen
10 mask suspension system aperture so as to form
11 an airtight seal between the oxygen mask and
12 the flexible cowl; and
- 13 5) Attaching the flexible cowl to a first rigid
14 helmet so as to form an airtight seal between
15 the first rigid helmet and the flexible cowl.

16

17 32) A method of fabricating an integrated respirator as
18 claimed in Claim 31 wherein location points on the
19 helmet ensure that the flexible cowl is correctly
20 located on the first rigid helmet and provide means
21 for connecting the first rigid helmet to a second
22 rigid helmet.

23

24 33) A method of fabricating an integrated respirator as
25 claimed in Claim 31 or Claim 32 wherein the step of
26 fabricating the flexible cowl further comprises the
27 steps of:

- 28 1) Vacuum forming a flexible material and fixing
29 the vacuum formed material by seam welding; and
- 30 2) Fabricating an airtight neck seal and attaching
31 said neck seal to the vacuum formed material;

32

1 34) A method of fabricating an integrated respirator as
2 claimed in Claim 33 wherein the step of fabricating
3 the flexible cowl further comprises the steps of:

- 4 1) Connecting a visor mist air supply to the vacuum
5 formed material; and
6 2) Connecting a pressure release valve to the vacuum
7 formed material.

8
9 35) A method of fabricating an integrated respirator as
10 claimed in Claim 31 to Claim 34 wherein the step of
11 locating the visor further comprises the step of
12 injection moulding the visor from a material of high
13 optical coating.

14
15 36) A method of fabricating an integrated respirator as
16 claimed in Claim 31 to Claim 35 wherein the step of
17 locating the visor further comprises the step of
18 coating the outer surface of the visor with a
19 nuclear, biological and chemical resistant coating.

20
21 37) A method of fabricating an integrated respirator as
22 claimed in Claim 31 to Claim 36 wherein the step of
23 locating the visor further comprises the steps of
24 coating the inner surface of the visor with an anti
25 fogging coating.